

TECHNICAL STANDARD ORDER

Federal Aviation Regulations

Part 37

Subject: AIRBORNE WEATHER RADAR EQUIPMENT OPERATING WITHIN THE RADIO-FREQUENCY BANDS OF 5,350 TO 5,470 MC. AND 9,300 TO 9,500 MC. TSO-C63a

Technical Standard Order for Aircraft Materials, Parts and Appliances

Part 37, Technical Standard Order Authorizations, consists of two subparts. Subpart A contains the general requirements for the issuance of TSO authorizations to manufacturers and is applicable to all Technical Standard Orders. Subpart B prescribes Technical Standard Orders which contain the minimum performance and quality control standards for specified materials, parts and appliances used on civil aircraft to which a particular article must conform in order to bear a TSO marking.

ANY TECHNICAL STANDARD ORDER MAY BE OBTAINED BY SENDING A REQUEST TO FAA, WASHINGTON, D.C. 20553.

Subpart A—GENERAL

§ 37.1 Applicability.

(a) This Part prescribes—

(1) Requirements for the issue of Technical Standard Order Authorizations; and

(2) Technical Standard Orders (hereafter referred to in this Part as "TSOs") containing minimum performance and quality control standards for specified materials, parts, or appliances (hereafter referred to in this Part as "articles") used on civil aircraft.

(b) The performance standards in each TSO are those that the Administrator finds necessary to ensure that the article concerned will operate satisfactorily or will accomplish satisfactorily its intended purpose under specified conditions.

(c) An article manufactured under a TSO authorization or an FAA letter of acceptance as described in § 37.3(b), is an approved article for the purpose of meeting the regulations of this chapter that require the article to be approved.

(d) For the purposes of this Part, a manufacturer is a person who controls the design and quality of an article produced under the TSO system (or to be produced, in the case of an application) including the parts thereof and any processes or services related thereto that are procured from an outside source.

§ 37.3 TSO authorization required.

(a) Except as provided in paragraph (b) of this section, no person may identify an article with a TSO marking unless he holds a TSO au-

thorization and the article meets applicable TSO standards.

(b) The holder of an FAA letter of acceptance of a statement of conformance issued for an article before July 1, 1962, may continue to manufacture that article without obtaining a TSO authorization, but shall comply with the requirements of §§ 37.7 through 37.21.

§ 37.5 Application and issue.

(a) The manufacturer (or his authorized agent) must submit an application for a TSO authorization, together with the following documents, to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which the manufacturer is located (or, in the case of the Western Region, the Chief, Aircraft Engineering Division):

(1) A statement of conformance certifying that the applicant has met the requirements of this subpart and that the article concerned meets the applicable performance standards of Subpart B of this Part.

(2) Copies of the technical data required in the applicable performance standards of Subpart B of this Part.

(3) A description of his quality control system in the detail specified in § ——— (present § 1.36 of this chapter).

In complying with this paragraph, the manufacturer may refer to current quality control data filed with the FAA as a part of a previous application. When a series of minor changes in accordance with § 37.11 is anticipated, the manufacturer

may set forth in his application the basic model number of the article with open brackets after it to denote that suffix change letters will be added from time to time.

(b) After receiving the application and other documents required by paragraph (a) of this section to substantiate the manufacturer's compliance with this Part and his ability to produce duplicate articles under this Part, the Administrator issues a TSO authorization to the manufacturer to identify the article with the applicable TSO marking.

(c) If the application is deficient, the applicant must, when requested by the Administrator, submit any additional information necessary to show compliance with this Part. If the applicant fails to submit the additional information within 30 days after the Administrator's request, his application is denied and the applicant is so notified.

(d) The Administrator issues or denies the application within 30 days after its receipt or, if additional information has been requested, within 30 days after receiving that information.

§ 37.7 General rules governing holders of TSO authorizations.

Each manufacturer of an article for which a TSO authorization has been issued under this Part must—

(a) Manufacture the article in accordance with Subpart A of this Part and the applicable requirements of Subpart B of this Part;

(b) Conduct all required tests and inspections, and establish and maintain a quality control system

1779

adequate to ensure that the article meets the requirements of paragraph (a) of this section and is in condition for safe operation;

(c) Prepare and maintain, for each model of each article for which a TSO authorization has been issued, a current file of complete technical data and records in accordance with § 37.13; and

(d) Permanently and legibly mark each article to which this section applies with the following information:

(1) The name and address of the manufacturer.

(2) The name, type, or model designation of the article.

(3) The weight of the article to the nearest 1/10 of a pound.

(4) The serial number or the date of manufacture of the article, or both.

(5) The applicable TSO number.

§ 37.9 Approval for deviation.

(a) Each manufacturer who requests approval to deviate from any performance standard of Subpart B of this Part must show that the standards from which a deviation is requested are compensated for by factors or design features providing an equivalent level of safety.

(b) The request for approval to deviate, together with all pertinent data, must be submitted to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which the manufacturer is located (or, in the case of the Western Region, the Chief, Aircraft Engineering Division).

§ 37.11 Design changes.

(a) *Minor changes by the manufacturer holding the authorization.* The manufacturer of an article under an authorization issued under this Part may make minor design changes (any change other than a major change) without further approval by the Administrator. In this case, the changed article keeps the original model number and the man-

ufacturer shall forward to the appropriate Chief, Engineering and Manufacturing Branch (in the case of the Western Region, the Chief, Aircraft Engineering Division), any revised data that is necessary for compliance with § 37.5(a).

(b) *Major changes by manufacturer holding the authorization.* Any design change by the manufacturer that is extensive enough to require a substantially complete investigation to determine compliance with Subpart B of this Part is a major change. Before making such a change, the manufacturer must assign a new type or model designation to the article and apply for an authorization under § 37.5.

(c) *Changes by person other than manufacturer.* No design change by any person (other than the manufacturer who submitted the statement of conformance for the article) is eligible for approval under this Part, unless the person seeking the approval is a manufacturer and applies under § 37.5(a). Persons other than a manufacturer may obtain approval for design changes under Part 43 or under the applicable airworthiness regulations.

§ 37.13 Recordkeeping requirements.

(a) *Keeping of records.* Each manufacturer holding a TSO authorization under this Part shall, for each article manufactured under that authorization, keep the following records at his factory:

(1) A complete and current technical data file for each type or model article, including design drawings and specifications.

(2) Complete and current inspection records showing that all inspections and tests required to assure compliance with this Part have been properly done and documented.

(b) *Retention of records.* The manufacturer shall retain the records described in subparagraph (a)(1) of this section until he no longer manufactures the article concerned under this Part. At that time, he shall send copies of these

records to the Administrator. The manufacturer shall retain the records described in subparagraph (a)(2) of this section for a period of at least two years.

§ 37.15 FAA inspection.

Upon the request of the Administrator, each manufacturer of an article under a TSO authorization shall allow the Administrator to inspect—

(a) Any article manufactured under that authorization;

(b) The manufacturer's quality control inspections and tests;

(c) The manufacturing facilities; and

(d) The technical data files on that article.

§ 37.17 Manufacturing and design defects.

Whenever the investigation of an accident or service difficulty report shows that an article manufactured under a TSO authorization is unsafe because of a manufacturing or design defect, the manufacturer shall, upon the request of the Administrator, report to the Administrator the results of his investigation and any action, taken or proposed by the manufacturer, to correct that defect. If action is required to correct the defect in existing articles, the manufacturer shall submit to the appropriate Chief, Engineering and Manufacturing Branch (in the case of the Western Region, the Chief, Aircraft Engineering Division), the data necessary for the issue of an appropriate airworthiness directive.

§ 37.19 Noncompliance.

The Administrator may, upon notice, withdraw the TSO authorization of any manufacturer who identifies with a TSO marking an article not meeting the applicable performance standards of this Part.

§ 37.21 Transferability and duration.

An authorization issued under this Part is not transferable and is effective until surrendered, or withdrawn or otherwise terminated by the Administrator.

§ 37.168 *Airborne weather radar equipment operating within the radio-frequency bands of 5,350 to 5,470 mc. and 9,300 to 9,500 mc.—TSO-C63a.*

(a) *Applicability.* This TSO prescribes the minimum performance standards that airborne weather radar equipment, to be used on U.S. civil aircraft engaged in air carrier operations, must meet in order to be identified with the applicable TSO marking. New models of such equipment which are to be so identified and which are manufactured on or after September 27, 1965, must meet the requirements set forth in the FAA Standard entitled "Minimum Performance Standards for Airborne Weather Radar Equipment Operating Within the Radio-Frequency Bands of 5,350 to 5,470 mc. and 9,300 to 9,500 mc.", dated March 15, 1965,¹ and Federal Aviation Agency document, "Environmental Test Procedures for Airborne Electronic Equipment", dated August 31, 1962.¹

(b) *Marking.*

(1) In addition to the markings specified in § 37.7, the equipment shall be marked to indicate the environmental extremes over which it has been designed to operate. There are six environmental test procedures outlined which have categories established. These should be identified on the nameplate by the words "Environmental Categories" or, as abbreviated, "Env. Cat." followed by six letters which identify the categories designated in the FAA document. Reading from left to right, the category designations shall appear on the nameplate in the following order so that they may be identified.

- (i) Temperature-Altitude Test Category;
- (ii) Vibration Test Category;
- (iii) Audio-Frequency Magnetic Field Susceptibility Test Category;

¹ Copies may be obtained upon request addressed to Library Services Division, HQ-620, Federal Aviation Agency, Washington, D.C. 20553.

(iv) Radio-Frequency Susceptibility Test Category;

(v) Emission of Spurious Radio-Frequency Energy Test Category; and

(vi) Explosion Test.

(2) Six classes of equipment based on range capability have been established in the FAA Standard under paragraph 2.4, Range Capability. The equipment shall be marked to indicate the distance range declared by the manufacturer.

(3) In some cases such as under the Temperature-Altitude Test Category, a manufacturer may wish to substantiate his equipment under two categories. In this case, the nameplate shall be marked with both categories in the space designated for that category by placing one letter above the other such as "Env. Cat. A BAAAX Class 3."

(4) Each separate component of equipment (antenna, synchronizer unit, indicator console, etc.) shall be identified with at least the manufacturer's name, TSO number, and the environmental categories over which the equipment component is designed to operate.

(c) *Data requirements.* In accordance with the provisions of § 37.5, the manufacturer shall furnish to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, Federal Aviation Agency, in the region in which the manufacturer is located, the following technical data:

(1) Six copies of the manufacturer's operating instructions and equipment limitations;

(2) Six copies of the installation procedures with applicable schematic drawings, wiring diagrams, and specifications, indicating any limitations, restrictions, or other conditions pertinent to installation; and

(3) One copy of the manufacturer's test report.

(d) *Effective September 27, 1965.*